

XXII. *Notes on Seasonal Dimorphism in certain African Butterflies.* By ARTHUR G. BUTLER, Ph.D., F.L.S., etc.

[Read Oct. 16th, 1895.]

MR. CECIL W. BARKER'S most interesting and instructive paper upon this subject is before me, and I only regret that the impossibility of risking the effect of night air prevented my being present at the meeting in April, when it was read, because I note, in the Proceedings of the Society, that the question was asked by Prof. Meldola whether Mr. Barker's observations had been supported by breeding experiments. Although this had not been done, our cabinets afford such a mass of evidence in support of his suggestions, that the case may be almost considered as good as proved.

As an example of what is here affirmed I may take one example; that of *Teracolus vesta*:—

The form *T. argillaceus* differs from the typical form chiefly in the rosy-ochreous instead of lemon-yellow colouring of the undersurface of the hindwings and apical area of forewings. If such a difference occurred in one type only of the same group, it might fairly be considered to have a specific value; but when we find that it recurs throughout the group, whether in Asia or Africa, the evidence in favour of its being illustrative of seasonal dimorphism becomes almost conclusive; so much so, that most Lepidopterists will certainly accept it, as having the authority of proof.

The following forms of this group of *Teracolus* in the Museum series will, in this event, have to be united:—

ASIATIC SPECIES.

Summer form

Winter form

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| 1. Unnamed. | <i>Teracolus protractus</i> , Butl. |
| 2. <i>Teracolus vestalis</i> , Butl. | <i>Teracolus intermissus</i> , Butl. |
| 3. <i>Teracolus puellaris</i> , Butl. | <i>Teracolus ochreipennis</i> , Butl. |

AFRICAN SPECIES.

Summer form.

Winter form.

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| 4. <i>Teracolus vesta</i> , Reiche. | <i>Teracolus argillaceus</i> , Butl. |
| 5. <i>Teracolus aurigineus</i> , Butl. | <i>Teracolus venustus</i> , Butl. |
| 6. <i>Teracolus chrysonome</i> , Klug. | <i>Teracolus helvolus</i> , Butl. |
| 7. <i>Teracolus gaudens</i> , Butl. | <i>Teracolus arenicoleus</i> , Butl. |

Seasonal dimorphism in butterflies is certainly much commoner than is generally supposed, and when thoroughly understood, will tend to explain away the difficulties arising from a study of intermediate grades between apparently distinct types, which will then be seen to be merely dry and wet-season forms of one and the same species.

As an example, I may mention that in the genus *Acræa* Dr. Staudinger, some years since, described a species under the name of *A. pudorina*, and he observed—"Hewitson regards this specimen as a doubtful variety of his *Acrita*, a beautiful example of which I also possess from Zanzibar. But *Acrita* has four to five large black spots on the forewings, and notably a broad black apex to the same, wherefore *Pudorina* can never belong to it." In 1894 Mr. Trimen figured a variety, observing that "Both sexes show a good deal of variation as regards the width of the apical fuscous border in the forewings, and in the numbers (seven or eight) and relative sizes of the rounded discal spots in the hindwings," etc., and in the same year I mentioned (P.Z.S., pp. 566-7):—"There is not the slightest question that this (*A. pudorina*) is a local representative of *A. acrita*, from which it only differs in the absence of the broad apical black patch on the primaries; in well-marked examples all the spots (on the absence of which Dr. Staudinger relies) are well defined; one specimen even shows an additional spot on the subcostal area, nearer to apex."

In 1895, however, I was forced to modify my opinion as regards the local value of the difference, by the arrival of a collection from Fwambo, B. C. Africa, in which we received an intermediate example "half-way between typical *A. acrita* and *A. pudorina*" (See P.Z.S., 1895, p. 261), which led me to adopt a different view respecting the meaning of this apical patch.

Among the species of the group to which *A. acrita* belongs, the apical black patch occurs no less than five

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times, and is, in each case, regarded as the principal character for distinguishing two otherwise similar species. Comparing the under surfaces, one sees either no difference whatever, or only such as has a purely individual value; whilst, occasionally, individuals come to hand in which the apical black patch of the upper surface varies between the two extreme types, clearly proving it to be valueless as a specific character; *A. acrita* indeed is only one of those intermediate grades itself, for the black apex is still more largely developed in *A. chæribula*.

These differences in *Acræa* I believe to be seasonal; the examples with the black apical patch being the wet-season forms. Supposing this to be a correct explanation of this curious and certainly inconstant difference, the species will stand as follows:—

Dry-season form.

Wet-season form.

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| 1. <i>Acræa anacreon</i> , Trimen. | * <i>Acræa bomba</i> , H. G. Smith. |
| 2. <i>Acræa guillemei</i> , Oberth. | <i>Acræa periphanes</i> , Oberth. |
| 3. <i>Acræa doubledayi</i> , Guér. | <i>Acræa dircæa</i> , Westw. |
| 4. <i>Acræa stenobæa</i> , Wallgr. | <i>Acræa caldarena</i> , Hewits. |
| 5. <i>Acræa pudorina</i> , Staud. | <i>Acræa chæribula</i> , Oberth. |

With regard to the above associations, it must be borne in mind that a species which, in a variable climate, is dimorphic, ceases to be so in a uniform climate, and thus it does not follow, because a species does not vary in one part of Africa, that it therefore shows equal constancy in another part: indeed, we now know that some of the Southern species which appear to breed from generation to generation true to type, break up into two widely different types in Central Africa. Then, again, in a climate neither unusually dry nor wet, an intermediate type may prevail, to the exclusion of the extremes. Hitherto we have not received typical *A. pudorina* from Nyasa-land, but we have a form so near to it, that no Lepidopterist would have the temerity to describe it as a distinct species; secondly, we have typical *A. acrita*; and, lastly, *A. chæribula*,† from Zomba.

Climatic modifications and seasonal forms result

* I cannot distinguish *A. induna* as a species, from this.

† I consider this the same as *A. ambigua*, Trimen.

practically from the same cause, and in some cases it will be very hard to draw the line between them: a uniformly moist locality may produce only a wet-season form, and a dry locality the converse; yet one could hardly speak of *Acræa pseudegina* as a seasonal form of *A. natalica*, but merely as a western development of that species (an intermediate form completely linking the two extremes occurs in Angola).

Whether the colour variations of *Acræa johnstoni* and other members of the *A. esebria* group are seasonal seems doubtful; indeed, from the evidence before me, I should say—*certainly not*; for we have extreme forms, collected within three days, that is to say, with only one day's interval between, and, moreover, both forms are in admirable condition. The species of the *A. esebria* group are therefore probably simply inconstant, no satisfactory reason for such inconstancy being at present known, or even guessed at.

The above observations will, I hope, help to impress upon collectors the importance of noting not only dates of capture of every specimen which they obtain, but also the altitude and nature of climate, so that Lepidopterists may have some definite data to work from in deciding these interesting questions touching the climatic relationships or seasonal dimorphism of the insects which come into their hands.